



4910-13P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Aviation Rulemaking Advisory Committee; Transport Airplane and Engine Issues; New Task

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of new task assignment for the Aviation Rulemaking Advisory Committee (ARAC).

SUMMARY: The FAA assigned the Aviation Rulemaking Advisory Committee (ARAC) a new task to provide recommendations regarding the incorporation of airframe-level crashworthiness and ditching standards into Title 14, Code of Federal Regulations (14 CFR) part 25 and development of associated advisory material. The issue is during the development of current airworthiness standards and regulatory guidance, the FAA assumed that airframe structure for transport airplanes would be constructed predominantly of metal, using skin-stringer-frame architecture. Therefore, certain requirements either do not address all of the issues associated with nonmetallic materials, or have criteria that are based on experience with traditionally-configured large metallic airplanes. With respect to crashworthiness, there is no airframe-level standard for crashworthiness. Many of the factors that influence airframe performance under crash conditions on terrain also influence airframe performance under ditching conditions. Past studies and investigations have included recommendations for review of certain regulatory

requirements and guidance material to identify opportunities for improving survivability during a ditching event; consideration of these recommendations is included in this tasking.

This notice informs the public of the new ARAC activity and solicits membership for the Transport Airplane Crashworthiness and Ditching Working Group.

FOR FURTHER INFORMATION CONTACT: Ian Won, Federal Aviation Administration, 1601 Lind Avenue SW, Renton, WA 98055, ian.y.won@faa.gov, phone number 425-227-2145, facsimile number 425-227-1232.

SUPPLEMENTARY INFORMATION:

ARAC Acceptance of Task

As a result of the March 19, 2015 ARAC meeting, the FAA has assigned and ARAC has accepted this task and will establish the Transport Airplane Crashworthiness and Ditching Working Group, Transport Airplane and Engine Issues. The working group will serve as staff to the ARAC and provide advice and recommendations on the assigned task. The ARAC will review and approve the recommendation report and will submit it to the FAA.

Background

The FAA established the ARAC to provide information, advice, and recommendations on aviation related issues that could result in rulemaking to the FAA Administrator, through the Associate Administrator of Aviation Safety.

The Transport Airplane Crashworthiness and Ditching Working Group will provide advice and recommendations to the ARAC on airframe-level crashworthiness and ditching standards to incorporate into part 25 and any associated advisory material.

The requirements of Title 14, Code of Federal Regulations (14 CFR) 25.561 apply equally to structure constructed from either metallic or nonmetallic materials, and regardless of the design architecture and airplane size. Guidance material is mainly contained in FAA Advisory Circular (AC) 25-17A. While not explicitly stated in part 25, during the development of current airworthiness standards and published advisory circulars, the FAA assumed that airplane airframes would be constructed predominantly of metal, using skin-stringer-frame architecture. Therefore, some of the requirements either do not address all of the issues associated with nonmetallic materials, or have criteria that are based on experience with traditionally-configured large metallic airplanes. With respect to crashworthiness, there is no airframe-level standard for crashworthiness. The FAA promulgated standards for occupant protection at the seat installation level, with the presumption that the airframe provides an acceptable level of crashworthiness. Thus when an applicant proposes to use unconventional fuselage structure (materials, design, or both), the FAA has written special conditions to ensure the level of crash protection is equivalent to that provided by a traditionally-configured metallic airplane. These special conditions have been comparative in nature, and do not establish performance standards that are independent of traditional metallic skin-stringer-frame architecture for airframe crashworthiness.

Crashworthiness Factors: Many factors influence the crashworthiness of an airframe, including materials of construction, geometry, structural philosophy, and fuselage size (fuselage diameter). The key elements of crashworthy airframe design are managing energy absorption and maintaining structural integrity. For the most part, energy absorption is managed through plastic deformation and controlled failures of the lower fuselage structure. Maintaining the integrity of

the structure is a balance between keeping loads within human tolerance levels, retaining items of mass, preserving a survivable volume and maintaining access to exits. Existing airworthiness requirements mainly focus on the safety of flight, and not crashworthiness, consequently when deviating from the traditional methods of construction an adequate level of safety cannot be assured.

Increased Use of Composites: In June 2009, the FAA Transport Airplane Directorate requested comments through the Federal Register (74 FR 26919) on whether there was a need for future rulemaking to address manufacturers' extensive use of composite materials in airplane construction. Several candidate technical areas were noted in the request, including fire safety, crashworthiness, lightning protection, fuel tank safety and damage tolerance. All responses that the FAA received indicated that crashworthiness in particular needs improved guidance and possible rulemaking.

Ditching: The FAA conducted several investigations on ditching and water-related impacts in the 1980s and 1990s. In conjunction with Transport Canada and the United Kingdom Civil Aviation Authority (UK CAA), the FAA recently investigated ditching/water-related impacts and ditching certification. One of the findings of these investigations is that current practices may not provide an adequate level of safety for the most likely ditching scenarios. From this research, a ditching event can be categorized as a specific type of emergency landing. Many of the factors (e.g., airframe energy absorption characteristics, structural deformation, etc.) that influence airframe performance under crash conditions on terrain also influence airframe performance under ditching conditions. Flight crew procedures, airplane configuration, safety equipment, and passenger preparedness also have a significant influence on survivability during a

ditching event. Findings from these investigations include recommendations for review of certain regulatory requirements and guidance material related to the aforementioned factors to identify opportunities for improving survivability during a ditching event.

The Task

The Transport Airplane Crashworthiness and Ditching Working Group is tasked to:

1. Specifically advise and make written recommendations on what airframe-level crashworthiness and ditching standards to incorporate into 14 CFR part 25 and any associated advisory material.
2. Evaluate §§ 25.561, 25.562, 25.563, 25.785, 25.787, 25.789, 25.801, 25.807, 25.1411, 25.1415, and associated regulatory guidance material (e.g., ACs and policy memorandums) to determine what aspects need to be revised to maintain the current level of safety. Evaluate Special Conditions Nos. 25-321-SC, 25-362-SC, 25-528-SC, 25-537-SC, as a basis for future requirements. The Transport Airplane Crashworthiness and Ditching Working Group will specifically review the following factors in making its recommendations:
 - a. Fuselage size effects as discussed in FAA report DOT/FAA/CT-TN90/23;
 - b. Safety benefit considerations as identified in CAA Paper 96011 (and any subsequent revisions);
 - c. Other non-traditional airplane level configurations or structural configurations (e.g., non-skin, stringer, frame construction).
3. Make recommendations, using the information in FAA reports DOT/FAA/TC-14/8 (draft), DOT/FAA/AR-95/54, DOT/FAA/CT-92/04, DOT/FAA/CT-84/3, FAA policy

memorandum PS-ANM100-1982-00124, and any other pertinent information that may be available on:

- a. Assumptions used in establishing the airplane configuration for ditching, both planned and unplanned;
 - b. Validation of assumptions used for establishing airplane flight performance for planned and unplanned ditching scenarios;
 - c. Procedures to be used to execute a successful ditching;
 - d. Minimum equipment needed to address the likely ditching scenarios.
4. Consider the performance of existing-conventional metallic airframe structure in crash conditions (with consideration to size effects) when developing recommendations for airframe-level crashworthiness and ditching standards, such that conventionally configured airplanes fabricated with typical metallic materials and design details can be shown to meet the proposed regulations without extensive investigation or documentation.
5. Based on the Transport Airplane Crashworthiness and Ditching Working Group recommendations, perform the following:
 - a. Estimate what regulated parties will do differently as a result of the proposed regulation and how much it would cost;
 - b. Estimate the improvement (if any) in survivability of future accidents from this proposed regulation (cite evidence in the historical record as support if possible);
 - c. Estimate any other benefits (e.g., reduced administrative burden) or costs that would result from implementation of the recommendations.

6. Develop a report containing recommendations on whether to incorporate airframe-level crashworthiness and ditching standards into 14 CFR part 25, the recommended requirements, and any associated advisory material.
7. Develop a report containing recommendations on the findings and results of the tasks explained above.
 - a. The report should document both majority and dissenting positions on the findings and the rationale for each position.
 - b. Any disagreements should be documented, including the rationale for each position and the reason for the disagreement.
8. Consider EASA requirements, accepted means of compliance (AMC) and guidance material (GM) for harmonization to the extent possible.
9. The Transport Airplane Crashworthiness and Ditching Working Group may be reinstated to assist the ARAC by responding to the FAA's questions or concerns after the recommendation report has been submitted.

Schedule

The recommendation report must be submitted to the FAA for review and acceptance no later than 24 months after publication of this notice.

Working Group Activity

The Transport Airplane Crashworthiness and Ditching Working Group must comply with the procedures adopted by the ARAC. As part of the procedures, the working group must:

1. Conduct a review and analysis of the assigned tasks and any other related materials or documents.

2. Draft and submit a work plan for completion of the task, including the rationale supporting such a plan, for consideration by the Transport Airplane and Engine Subcommittee.
3. Provide a status report at each Transport Airplane and Engine Subcommittee meeting.
4. Draft and submit the recommendation report based on the review and analysis of the assigned tasks.
5. Present the recommendation report at the Transport Airplane and Engine Subcommittee meeting.

Participation in the Working Group

The Transport Airplane Crashworthiness and Ditching Working Group will be comprised of technical experts having an interest in the assigned task. A working group member need not be a member representative of the ARAC. The FAA would like a wide range of members to ensure all aspects of the tasks are considered in development of the recommendations. The provisions of the August 13, 2014 Office of Management and Budget guidance, “Revised Guidance on Appointment of Lobbyists to Federal Advisory Committees, Boards, and Commissions” (79 FR 47482), continues the ban on registered lobbyists participating on Agency Boards and Commissions if participating in their “individual capacity.” The revised guidance now allows registered lobbyists to participate on Agency Boards and Commissions in a “representative capacity” for the “express purpose of providing a committee with the views of a nongovernmental entity, a recognizable group of persons or nongovernmental entities (an industry, sector, labor unions, or environmental groups, etc.) or state or local government.” (*For*

further information see Lobbying Disclosure Act of 1995 (LDA) as amended, 2 U.S.C 1603, 1604, and 1605.)

If you wish to become a member of the Transport Airplane Crashworthiness and Ditching Working Group, write the person listed under the caption FOR FURTHER INFORMATION CONTACT expressing that desire. Describe your interest in the task and state the expertise you would bring to the working group. The FAA must receive all requests by **[insert date 30 days after publication of this notice]**. The ARAC and the FAA will review the requests and advise you whether or not your request is approved.

If you are chosen for membership on the working group, you must actively participate in the working group by attending all meetings, and providing written comments when requested to do so. You must devote the resources necessary to support the working group in meeting any assigned deadlines. You must keep your management chain and those you may represent advised of working group activities and decisions to ensure the proposed technical solutions do not conflict with the position of those you represent. Once the working group has begun deliberations, members will not be added or substituted without the approval of the ARAC Chair, the FAA, including the Designated Federal Officer, and the Working Group Chair.

The Secretary of Transportation determined the formation and use of the ARAC is necessary and in the public interest in connection with the performance of duties imposed on the FAA by law.

ARAC meetings are open to the public. However, meetings of the Transport Airplane Crashworthiness and Ditching Working Group are not open to the public, except to the extent

individuals with an interest and expertise are selected to participate. The FAA will make no public announcement of working group meetings.

Issued in Washington, DC, on May 28, 2015.

Brenda D. Courtney,
Acting Designated Federal Officer,
Aviation Rulemaking Advisory Committee.
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